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Reiner Martin, Edward O'Brien,
M. Udara Peiris, Dimitrios P. Tsomocos

Distressed assets and fiscal-monetary support: are AMCs a third way?

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Abstract

Following the Global Financial Crisis of 2007-8, Ireland, Slovenia, and Spain set up public Asset Management Companies (AMCs), purchasing delinquent loans equal to 44%, 16%, and 10% of GDP, respectively. Though deemed successful, it's unclear if this was *de facto* traditional capital and liquidity support. We show that AMCs have a systematic advantage in reducing pecuniary externalities and costs associated with loan delinquencies. AMCs enhance average returns to bank lending, promoting additional lending (bank lending channel) and improving corporate borrowers' balance sheets (balance sheet channel). The welfare gains of well-designed and well-managed AMCs are between 0.2% and 0.5% of steady-state consumption, independent of whether they are financed through fiscal transfers or sterilized monetary transfers; AMCs can complement traditional fiscal and monetary policies in managing financial crises.

Keywords: Distressed Assets, Eurozone, Monetary Policy, Fiscal Policy, AMC.

JEL Classification: E44, G18, G21, G28

Non-Technical Summary

After the global financial crisis, programmes like the Troubled Asset Relief Program (TARP) in the US, and public Asset Management Companies (AMCs) in Europe, were implemented to stabilise banks through government intervention. TARP shifted from purchasing illiquid mortgage-backed securities to providing capital support, affecting banks' risk-taking and boosting lending and investment (Duchin and Sosyura, 2014; Dávila and Walther, 2020). Fiscal support measures, such as those employed by TARP, are traditional responses to increased delinquencies in banks' loan portfolios during economic downturns (Kollmann et al., 2012; Diamond and Rajan, 2012; Gertler et al., 2012). In addition, central banks stabilise financial markets using lender-of-last-resort mechanisms (Carlson et al., 2011; Santos and Suarez, 2019) and quantitative easing to enhance liquidity and encourage lending during downturns (Cui and Sterk, 2021; Crosignani et al., 2020). While both TARP and public Asset Management Companies (AMCs) involve government intervention to stabilise banks, they differ in approach: AMCs—established globally over the past 30 years and funded publicly or through public-private partnerships—resolve crises by purchasing non-performing loans (NPLs) and directly managing troubled assets[1]. Although AMCs can have balance sheets exceeding 40% of GDP, the mechanisms by which they enhance macro-stability and welfare—and their reliance on monetary and fiscal support—are not well studied. By substituting for a missing secondary market for delinquent loans and stabilising NPL prices over the business cycle, we show that AMCs promote lending and strengthen the balance sheets of banks and corporate borrowers, and improve welfare. Furthermore, an AMC's effectiveness is not affected by whether it is funded fiscally or monetarily; it serves as an alternative policy tool to traditional fiscal and monetary policies.

Experiences in the Eurozone post-2008 show how AMCs can stabilise financial sectors by managing non-performing loans (NPLs). Countries like Ireland and Spain implemented sizeable delinquent loan purchase programmes through AMCs; Ireland's National Asset Management Agency (NAMA) represented around 44% of GDP, while Slovenia and Spain had AMCs of approximately 16% and 8% of GDP, respectively. While generally considered successful, analysis of the mechanisms by which they operate has been largely absent (Medina Cas and Peresa, 2016). We investigate whether the success of these programmes was purely due to mechanisms found in other forms of fiscal or monetary support to the banking system. Our findings show that AMCs are effective because they operate through both the bank lending and balance sheet channels, reinforcing each other.

Employing a closed-economy Real Business Cycle (RBC) model calibrated to Eurozone data, we show that AMCs primarily operate through two mechanisms: they directly promote additional

[1] Public Asset Management Companies (AMCs) were first implemented in the early 1990s with initiatives like Securum in Sweden and the Resolution Trust Corporation (RTC) in the United States. They were employed again during the Asian financial crisis, exemplified by entities such as Danaharta in Malaysia and the Korea Asset Management Corporation (KAMCO) in South Korea.

lending via the bank lending channel and indirectly improve corporate borrowers' balance sheets (the balance sheet channel). The AMC purchases loans from banks at prices based on the steady-state rate of default rather than prevailing market conditions. During downturns, this approach allows banks to receive higher-than-market prices for their loans, boosting returns to lending, and enabling them to offer higher rates to depositors. The increase in deposit rates leads to a larger supply of deposits, easing credit constraints for firms and spurring greater investment, output, and profits. Improved profits enhance corporate equity values, which in turn bolster, in aggregate, firms' creditworthiness, and consequently repayment rates. This creates a positive feedback loop, further enhancing returns for financial intermediaries as banks can reduce lending rates to firms while simultaneously offering better returns to depositors. Our findings suggest that AMCs can foster a virtuous cycle of investment and financial stability.

AMCs' effectiveness lies in providing a market for delinquent loans, thereby enhancing banks' lending capacity and supporting borrower net worth, which ultimately drives economic growth. For example, in the US, Drucker and Puri (2009) demonstrate that loan sales, despite restrictive covenants, increase credit availability for high-risk borrowers engaged in capital-intensive projects like acquisitions and leveraged buyouts. They find that sold loans are nearly twice the size of retained ones, primarily because nonbank institutions in the secondary market provide additional funding without originating loans. In our model, AMCs improve welfare by restoring the lending capacity of banks, net worth of borrowers, and supporting economic growth through increased investment. We find welfare gains ranging from 0.2% to 0.5% of quarterly steady-state consumption, independent of the financing method used. The funding structure of the AMC—whether fiscal or monetary—is not quantitatively significant for its effectiveness, suggesting that it is an alternative policy tool to traditional fiscal and monetary policies. Our findings contrast with studies on traditional fiscal interventions, which often reveal that government-funded bailouts or recapitalisations create fiscal strains and reduce long-term financial resilience (Gorton and Huang, 2004; Nosal and Ordoñez, 2016). For instance, Dávila and Walther (2020) argue that bailout structures can overlook systemic risks, inadvertently supporting inefficiencies. Our AMC approach avoids these pitfalls by directly targeting distressed assets, thereby reducing the need for government involvement in capital injections.

AMCs provide a more stable and transparent alternative to bail-ins, alleviating liquidity constraints and sustaining depositor confidence without increasing risks to taxpayers or creditors. Bail-ins are often less effective when creditor exposure is highly concentrated or when markets are distressed (Jacobson and Schedvin, 2015), and correlated risks across bank balance sheets can lead to systemic risk due to asset commonality (Allen et al., 2012). While ex-ante measures like deposit insurance, capital requirements, and monitoring aim to prevent financial crises, they have notable limitations. For instance, private agents may fail to internalise the equilibrium effects on asset prices, leading to excessive risk-taking during booms that precede busts (Lorenzoni, 2008). AMCs operate through transparent asset acquisition and management, restoring market confidence and reducing the need for additional liquidity support without directly impacting taxpayers or creditors. By acquiring non-performing loans, AMCs prevent destabilising balance-sheet contractions, sustain depositor confidence, and ease credit constraints, all while avoiding adverse incentives associated with traditional fiscal interventions. In our analysis, AMCs enhance corporate equity values and firm repayment rates, complementing the regulatory tools proposed by Hanson et al. (2011) for systemic stability. This aligns with positive welfare implications observed in empirical studies on AMCs, such as Ireland's NAMA, which enhanced bank stability and recovery rates for distressed assets without imposing excessive fiscal burdens (Medina Cas and Peresa, 2016; Meisenzahl, 2014).

1 Introduction

After the global financial crisis, programs like the Troubled Asset Relief Program (TARP) in the US and public Asset Management Companies (AMCs) in Europe stabilized banks through government intervention. TARP shifted from buying illiquid mortgage-backed securities to providing capital, affecting banks' risk-taking and boosting lending (Duchin and Sosyura, 2014; Dávila and Walther, 2020). Such fiscal measures traditionally address rising loan delinquencies in downturns (Kollmann et al., 2012; Diamond and Rajan, 2012; Gertler et al., 2012). Central banks also stabilize markets via lender-of-last-resort mechanisms (Carlson et al., 2011; Santos and Suarez, 2019) and quantitative easing to enhance liquidity and lending (Del Negro et al., 2017; Cui and Sterk, 2021; Crosignani et al., 2020). While both TARP and AMCs involve government support, AMCs—established globally over the past 30 years and funded publicly or through public-private partnerships—resolve crises by acquiring non-performing loans (NPLs) and managing troubled assets.[2] Although AMCs have held assets exceeding 40% of GDP, their macro-stabilizing mechanisms and reliance on fiscal or monetary support are underexplored. We show that by substituting for missing secondary markets and stabilizing NPL prices, AMCs promote lending, strengthen banks and borrowers, and improve welfare. Moreover, AMC effectiveness does not depend on whether funding is fiscal or monetary, making them an alternative tool to standard fiscal and monetary policies.

Experiences in the Eurozone post-2008 show how AMCs can stabilize financial sectors by managing non-performing loans (NPLs). Countries like Ireland and Spain implemented sizable delinquent loan purchase programs through AMCs; Ireland's National Asset Management Agency (NAMA) represented about 44% of GDP, while Slovenia and Spain had AMCs of approximately 16% and 10% of GDP, respectively. While these efforts are generally viewed as successful, detailed analysis of their underlying mechanisms has been scarce (Medina Cas and Peresa, 2016). To address this gap, we next present a closed-economy RBC model, calibrated to Eurozone data, that identifies the channels through which AMCs influence financial stability and economic outcomes.

Using a closed-economy RBC model calibrated to Eurozone data, we show that AMCs operate primarily through two key channels: the bank lending channel and the corporate borrowers' balance sheet channel. AMCs purchase loans at prices tied to the steady-state default rate rather than prevailing market conditions. During downturns, this allows banks to sell loans above distressed-market prices, raising their lending returns. Banks consequently offer higher deposit rates, attract more deposits, and ease credit constraints, which encourages investment, output, and profits. Improved profitability enhances corporate equity values and borrower creditworthiness, further increasing financial intermediaries' returns. As a result, banks can lower lending rates while maintaining competitive deposit returns, creating a virtuous cycle that promotes

[2] First implemented in the early 1990s (e.g., Securum in Sweden, the Resolution Trust Corporation in the US), AMCs reemerged during the Asian financial crisis, exemplified by entities like Danaharta in Malaysia and KAMCO in South Korea.

financial stability and economic expansion.

This AMC-driven mechanism differs from interventions like the liquidity facilities analyzed by Del Negro et al. (2017), which eased balance sheet constraints by improving asset liquidity and reducing resale frictions. While such liquidity support mitigates market-wide stress, AMCs directly target distressed loans, removing them from bank balance sheets and fostering conditions for robust lending without elevating systemic risk. By substituting for missing secondary markets for delinquent loans and stabilizing NPL prices over the business cycle, AMCs stimulate lending, strengthen banks and borrowers, and ultimately improve welfare.

We show that AMCs yield welfare gains ranging from 0.2% to 0.5% of quarterly steady-state consumption, independent of whether their funding is fiscal or monetary. By restoring bank lending capacity and bolstering borrower net worth, AMCs promote investment and spur economic growth. These outcomes contrast with traditional fiscal interventions, such as broad-based bailouts or recapitalizations, which can impose sizable fiscal burdens and erode long-term financial resilience (Gorton and Huang, 2004; Nosal and Ordoñez, 2016; Dávila and Walther, 2020). By directly addressing troubled loans, AMCs avoid these pitfalls and provide a more targeted, efficient method of stabilizing the financial system.

AMCs offer a stable, transparent alternative to measures like bail-ins, which can falter in distressed markets or when creditor exposure is concentrated (Jacobson and Schedvin, 2015). In addition, correlated risks across bank balance sheets may propagate systemic fragility (Allen et al., 2012), and even robust ex-ante policies, such as deposit insurance and capital requirements, cannot fully prevent excessive risk-taking during booms (Lorenzoni, 2008). By directly acquiring non-performing loans, AMCs maintain depositor confidence, sustain credit supply, and alleviate liquidity constraints without shifting the burden onto taxpayers or creditors. This complements the systemic stability measures proposed by Hanson et al. (2011) and aligns with evidence that initiatives like Ireland's NAMA enhanced bank stability and asset recovery without imposing excessive fiscal costs (Medina Cas and Peresa, 2016; Meisenzahl, 2014).

2 A Primer on Asset Management Companies

Asset Management Companies remove impaired assets from troubled banks, cleaning up balance sheets and facilitating recovery. While the terms 'AMC' and 'bad bank' are often used interchangeably, they differ significantly in function and timing. An AMC is established to acquire impaired assets from multiple banks, acting as a system-wide solution (see, for example, Hryckiewicz et al., 2023). In contrast, a bad bank remains after a troubled bank's good assets and liabilities are transferred away, leaving behind an entity to be wound down. For example, the European Union's 2014 Bank Recovery and Resolution Directive describes a 'closed bank resolution' where a bank splits into a good bank that continues operations and a bad bank that is liquidated. Figure 3 in the Appendix describes the various NPL resolution mechanisms and how they compare to AMCs.[3]

AMCs function primarily by addressing the 'inter-temporal pricing gap' that arises when market prices for NPLs and their collateral are depressed, often due to market illiquidity or heightened risk aversion. By acquiring these distressed assets and holding them over time, AMCs can prevent fire sales that might otherwise occur if multiple banks simultaneously attempt to offload their NPLs. This strategy allows AMCs to wait for economic recovery, during which the value of these assets typically increases, thereby maximizing their recovery value (Fell et al., 2016).

Over the past 30 years, systemic Asset Management Companies (AMCs) have been used in various parts of the world, particularly in Europe and Asia, to address high non-performing loan (NPL) stocks in banking systems. These institutions serve as a mechanism to transfer NPLs from bank balance sheets, allowing banks to focus on new lending and aiding economic recovery. While AMCs have been successful in several cases, their effectiveness depends on various factors, including the legal and regulatory frameworks of the countries in which they operate. Their prominence has been seen in the aftermath of financial crises such as the 1997 Asian financial crisis and the eurozone sovereign debt crisis (Asian Development Bank, 2021; Fell et al., 2016).

Using data from the *Building Better Bad Banks* project by Hallerberg and Gandrud (2015), which includes 139 cases of AMCs across 62 countries from 1996 to 2016, Park et al. (2021) estimates a dynamic panel regression model to analyze changes in non-performing loans. Their model controls for a range of macroeconomic factors, including GDP growth, inflation, exchange rate changes, and the volatility index (VIX), and includes a dummy variable indicating whether an AMC was present. The dataset also incorporates information on financial sector bailouts, sourced from Bova et al. (2016), and macroprudential policies from Cerutti et al. (2015). Park et al. (2021) shows a significant negative effect of the AMC dummy, indicating that the presence of public AMCs is associated with a reduction in NPL ratios. This highlights the effectiveness of public AMCs in resolving bad loans and stabilizing financial systems.

Balgova et al. (2017) further support this finding, showing that public AMCs are more effective in reducing NPL ratios when combined with public bailout funds. Similarly, Park et al. (2021) find that public AMCs are the only NPL policy consistently showing significant results. However, they urge caution in interpreting this outcome, as it reflects the core function of public AMCs—acquiring and removing NPLs from banks' balance sheets. Their findings suggest that public AMCs have been widely adopted to help countries manage and significantly reduce their

[3]The European Union formally recognized the role of AMCs in its 2017 EU Council Action Plan on NPLs, which emphasized the importance of these institutions in addressing large NPL stocks in eurozone countries. The European Central Bank (ECB) has contributed to developing a blueprint for systemic AMCs, outlining best practices for their creation and management. The 2018 AMC blueprint highlighted the need for legal clarity, particularly regarding state aid rules and bail-in regulations, to ensure that AMCs could operate effectively within the eurozone's regulatory framework (Medina Cas and Peresa, 2016; Huljak et al., 2020).

NPLs, achieving substantial success in this role.

Asset Management Companies have been pivotal in addressing NPL issues worldwide, yielding both successes and challenges. In the eurozone, Ireland's NAMA, established in 2009, effectively stabilized the banking system by acquiring toxic loans near their real economic value, returning approximately €1.6 billion to the government by 2016 (Medina Cas and Peresa, 2016). Similarly, South Korea's KAMCO purchased about 75% of NPLs during the 1997 Asian financial crisis, recovering around 60% of their value by 2004 (He, 2004). Malaysia's Danaharta also performed well, recovering 58% of acquired NPLs by 2005 (Asian Development Bank, 2021). Sweden's AMC during the 1990s banking crisis is frequently cited as a model for restoring banking sector stability (Jonung, 2009).

Conversely, some AMCs faced significant hurdles. Spain's SAREB, created in 2012, struggled with liquidity and asset valuation, recovering only about 20% of bad assets by 2017 (Medina Cas and Peresa, 2016). Indonesia's AMC recovered less than 30% of bad loans by the mid-2000s due to insufficient financial and institutional support (He, 2004). These experiences highlight the importance of robust legal frameworks, proper asset valuation, liquidity management, and adequate capitalization in the success of AMCs.[4]

Ultimately, the success of AMCs often depends on their integration with broader economic policies. In countries where AMCs were paired with strong regulatory reforms and adequate financial support, such as in Ireland and South Korea, they have played a crucial role in stabilizing the banking sector. In contrast, in countries with weaker institutional frameworks, like Indonesia, AMCs were less effective in resolving NPLs.

3 An RBC Model with Money, Banks, and an AMC

We extend the closed economy RBC model of Jaccard (2024) that incorporates a household, corporate, and banking sector that intermediates funds between the two. To this setup, we introduce endogenous default by the firms on their loans to the banks. In addition, we introduce an agency (AMC) that purchases loans from banks at a price that depends on the steady-state rate of default. The AMC's funding structure can be purely fiscal (fiscal-neutral) or purely monetary (sterilized liquidity injections). These two extremes allow us to examine the role of the funding decision on the outcomes of the AMC.[5]

[4] One major issue is that AMCs are often reactive rather than proactive, addressing NPL problems after they have become severe. This limits their ability to prevent NPL accumulation during times of economic growth. Additionally, the costs of setting up and managing AMCs can be substantial. For example, public funds are frequently required to recapitalize banks alongside the creation of AMCs, which can place considerable financial pressure on governments. In Spain, SAREB required billions in government support, which strained public finances even as the recovery was slower than expected (Ernst & Young, 2017).

[5] In the European context, owing to the national accounting regime, nations that established AMCs did not have to account for them in the national accounts; that is, the AMC's balance sheet was not included in national debt. In this way, the debts raised to facilitate the establishment of the AMC can be seen as 'external' as they

The deterministic growth rate along the balanced growth path is denoted by γ (rate of population growth). Adjustment costs are rebated as lump sum transfers to focus on marginal effects. The maximization problem for each agent is given in the Appendix.

Households

Households maximize the value of consumption c_t and leisure z_t by renting labor n_t to firms for wages w_t from their endowment of time 1. τ_t is the labor tax rate raised on behalf of the AMC when it is operational. In Equation 1, households invest capital x_t and rent capital k_t to firms at a rate of r_{K_t}. They make deposits at banks D_t in nominal terms and purchase government debt B_{t+1}. Deposits pay an intraperiod return of $i_{D,t}$ but their principal is only available the following period. Government bonds are standard one-period nominally riskless bonds. The interest rate on government bonds $i_{B,t}$. $\Pi_{f_t} + \Pi_{b_t}$ is the sum of profits from firms and commercial banks, respectively. $P_t\Upsilon_t$ is the transfer from the monetary-fiscal authority and amounts to the net seigniorage transfer. The flow budget constraint is

$$\begin{aligned} c_t + x_t + \gamma\frac{M_{t+1}}{P_t} + \frac{1}{1+i_{B_t}}\gamma\frac{B_{t+1}}{P_t} \\ = \Pi_{f_t} + \Pi_{b_t} + P_t\Upsilon_t + r_{K_t}k_t + w_t n_t(1-\tau_t) + i_{D_t}\frac{D_t}{P_t} + \frac{M_t}{P_t} + \frac{B_t}{P_t}. \end{aligned} \tag{1}$$

The labor (n_t)-leisure (z_t) trade-off depends on the endowment of time, set to 1, $z_t + n_t = 1$. The cash constraint is $\gamma M_{t+1} = D_t$, where it is binding as interest rates are assumed to be strictly positive, and where D_t is nominal deposits and γM_{t+1} is the cash needed for deposits. Capital accumulation is given by $\gamma k_{t+1} = (1-\tilde{d})k_t + \left(\frac{\theta_1}{1-\epsilon}\left(\frac{x_t}{k_t}\right)^{1-\epsilon} + \theta_2\right)k_t$, where $\tilde{d}$ is the depreciation rate on capital and ϵ, θ_1, and θ_2 govern the elasticity of capital with respect to investment. Welfare is given by the lifetime utility $V_0 = \mathbb{E}_0\sum_{t=0}^{\infty}\hat{\beta}_t\frac{(c_t^{\kappa}(\psi + z_t^{\nu}))^{1-\sigma}}{1-\sigma}$, where $\hat{\beta} = \tilde{\beta}\gamma^{1-\sigma}$.

Firms

Firms are infinitely lived and pay dividends to owners. Revenue from production/sales is (y_t) and depends on capital (k_t) and labor (n_t) with output being generated from a constant returns to scale production function. Firms maximize the present discounted value of dividends/profits (Π_t), or equivalently, the value of equity is given by $\nu_t = \Pi_t + r_t k_t + \beta\frac{\lambda_{t+1}}{\lambda_t}\mathbb{E}_t\nu_{t+1}$, where λ_t is the marginal value of profits for the firm and β is the firm's discount factor.

are not accounted for nationally. In reality, there is a contingent liability, only realizable in case the AMC fails in its aims.

Firms take intraperiod loans from banks l_t at net interest rate $i_{L,t}$. When debt is due, they can renegotiate with creditors and obtain a haircut (or debt forgiveness) of $\delta_t\%$. The cost of renegotiating this debt is $\frac{\Omega_t}{1+\xi}\left[\delta_t l_t(1+i_{L,t})\right]^{1+\xi}$ where Ω_t is a macro-variable (that firms take as given) that governs the marginal cost of renegotiating debt (default), termed "credit conditions" and represents the aggregate propensities of borrowers to repay their debts with $\Omega_t = \left(\frac{N_t}{\bar{N}_s}\right)^{\omega_s}$ where $\omega_s > 0$ reflects the elasticity of this variable with respect to the equity value. Ω_t reflects changing motivations and incentives of debtors to make the necessary sacrifices to repay their obligations (see Roch and Uhlig, 2016; Peiris et al., 2024). It varies positively with the aggregate equity value of firms ($N_t = \int \nu_t$ is the aggregate value of equity of all firms), but individual firms do not internalize how their borrowing decisions affect aggregate credit conditions. $\frac{\Omega_t}{1+\xi}\left[\delta_t l_t(1+i_{L,t})\right]^{1+\xi}$ is the pecuniary cost of the loss-given-default (cost of renegotiating the debt) where $\psi > 0$ governs the elasticity of the cost of renegotiation with respect to the gain (where $\delta_t l_t(1+i_{L,t})$ is the total haircut on debt).

Output is given by $y_t = a_t k_t^{\alpha} n_t^{1-\alpha}$ where total factor productivity follows $\log a_t = \rho_a \log a_{t-1} + \epsilon_a$, and where $1 > \rho_a \geq 0$, and ϵ_a is a shock of mean 0 and standard deviation σ_a. Profits are given by $\Pi_{f,t} = y_t - r_{K,t}k_t - w_t n_t + (1-(1-\delta_t)(1+i_{L,t}))l_t - \frac{\Omega_t}{1+\xi}[\delta_t l_t(1+i_{L,t})]^{1+\xi}$, subject to working capital constraint $\frac{L_t}{P_t} \geq \mu(r_{K_t}k_t + w_t n_t)$. This states that a fraction μ of the cost of capital and labor per period must be financed by loans.

The optimality conditions for capital and labor are $r_{K,t} = \frac{\alpha\frac{y_t}{k_t}}{1+\mu i_{L,t}}$ and $w_t = \frac{(1-\alpha)\frac{y_t}{n_t}}{1+\mu i_{L,t}}$. The demand for labor is given by $l_t = \mu\frac{y_t}{1+\mu i_{L,t}}$. The marginal cost of defaulting equals the marginal cost of repayment is given by

$$\Omega_t[\delta_t l_t(1+i_{L,t})]^{1+\xi} = 1. \tag{2}$$

The marginal pecuniary cost of renegotiating debt is $\Omega_t\left[\delta_t l_t(1+i_{D,t})\right]^{\xi}$ while the marginal pecuniary benefit is 1. As a result, when aggregate conditions improve, and industry equity value increases, Ω_t increases, and the marginal pecuniary cost of renegotiating debt increases, and the firms choose a lower haircut δ_t. Similarly, higher industry indebtedness reduces profits and equity values, and haircuts of debt are higher.

As firms may choose to renege on some of their contractual debt obligations, but then suffer a renegotiation cost proportional to the scale of default, the decision to default is strategic. This cost effectively creates a borrowing constraint and stems from Goodhart et al. (2006) and De Walque et al. (2010) in a banking environment. Firms pay lenders a total pecuniary return on their debt of $(1-\delta_t)(1+i_{L,t})$ but incur a pecuniary penalty for the haircut obtained, equal to $\delta_t(1+i_{L,t})$ (see Appendix for derivations). As a result, the effective cost to the firm of the debt is $(1+i_{L,t})$. The wedge between the effective cost of debt to the firm, and the total return to the lenders is δ_t and represents the inefficiency or dead-weight loss incurred as a result of default. Importantly, the total cost of debt paid by firms is equated to the total return on capital investment by firms. Higher total costs of debt because of higher default rates reduce investment, a mechanism which the AMC mitigates, and discussed in the next section.

Commercial Banking Sector

The commercial banking sector plays a critical role in mediating funds between households and the nonfinancial sector. We posit that banks are equipped with a technology that allows for the creation of credit using deposits as input. This process is represented by a linear production function that correlates the quantity of loans extended to the nonfinancial sector with the quantity of deposits gathered at the start of the period (we follow Van den Heuvel, 2008; Jaccard, 2024).

The sequence of events in our banking model is as follows: At the onset of the period, banks receive deposits from households, denoted as a real quantity of deposit $d_t = \frac{D_t}{P_t}$. Subsequently, these deposits are used to provide loans to firms, represented by the loan quantity $l_t = \frac{L_t}{P_t}$. As the period progresses, banks collect the sum $(1 + i_{L,t})(1 - \delta_t)\frac{L_t}{P_t}$ from firms, which includes the principal and interest on the loans less the fraction that is defaulted upon. Before the period concludes, banks repay the households' deposits with interest, totaling $(1 + i_{D,t})\frac{D_t}{P_t}$.

When the AMC is operational it purchases loans from banks after they have been extended paying a price of $(1 + i_{L,t})(1 - \bar{\delta})\frac{L_t}{P_t}$ while firms pay $(1 + i_{L,t})(1 - \bar{\delta})\frac{L_t}{P_t}$. As we assume banks are obliged to sell to the AMC, this means that banks take the default rate offered by the AMC (as well as the interest rate) as given when loans are extended. Our approach simplifies the analysis by assuming that both the lending and deposit transactions occur within the same period, thereby streamlining the understanding of banking operations and their impact on the economic system. The lending constraint faced by banks results in the cost of deposits being lower than the required return on loans: $l_t = \eta d_t$, where $\eta < 1$. The profit function of banks is given by

$$\begin{aligned} \Pi_{b,t} &= l_t(1 - \delta_t)(1 + i_{L,t}) - d_t(1 + i_{D,t}) - l_t + d_t \\ &= \eta d_t((1 - \delta_t)(1 + i_{L,t}) - 1) - d_t i_{D,t}. \end{aligned} \tag{3}$$

The optimality condition is given by

$$i_{L,t} = \frac{\frac{1}{\eta} i_{D,t} + 1}{(1 - \delta_t)} - 1. \tag{4}$$

Note that when the AMC is operational, $\delta_t = \bar{\delta}$ in Equations 3 and 4. Equation 4 says that as the non-performing loans rate increases, the lending rate increases. If the AMC purchases loans at a lower default rate, this reduces the interest rate paid by firms, given the deposit rate. Conversely, given the lending rate, the AMC purchasing loans results in a higher total return on lending, which is then passed through to depositors in the form of higher deposit rates. In general equilibrium, the latter dominates and results in an expansion in the supply of loanable funds. This is because the interest rate firms are willing to pay incorporates their actual rate of default, so although banks are willing to lower the lending rate, this is offset by the propensity of firms to default. It is the expansion in the supply of loanable funds that ultimately reduces the lending rate.

Monetary and Fiscal Policy

The central bank follows an interest rule. While our results hold for a monetary rule as in Jaccard (2024), an interest rate rule clarifies that our results are not driven by particular aggregate consequences of money supply. The Taylor Rule is $\frac{1+i_{B_t}}{1+\bar{i}_B} = \left(\frac{1+i_{B_t}}{1+\bar{i}_B}\right)^{\phi_{i_B}} \left(\frac{\pi}{\bar{\pi}}\right)^{\phi_\pi} \left(\frac{y_t}{\bar{y}}\right)^{\phi_y} e^{\epsilon_{i_{B_t}}}$ where $\epsilon_{i_{B_t}}$ is a shock with mean 0 and standard deviation σ_{i_B}, and ϕ_{i_B}, ϕ_π, and ϕ_y are smoothing parameters. Fiscal Policy is given by the net (seigniorage) transfer

$$P_t \Upsilon_t = \gamma \frac{M_{t+1}}{P_t} - \frac{M_t}{P_t} + \frac{1}{1+i_{B_t}} \gamma \frac{B_{t+1}}{P_t} - \frac{B_t}{P_t}. \tag{5}$$

Equation 5 is also the unified monetary-fiscal authority budget constraint. Note that unfunded monetary transfers ($P_t \Upsilon_t$) raise the price level (cf. Fiscal Theory of the Price Level, see McMahon et al., 2018). The transfer also corresponds to the budget deficit of the combined fiscal-monetary authority. In the steady state, we set this deficit to be 10%. Dynamically government debt, B_{t+1}, is held at its steady state level, and the nominal transfer adjusts to satisfy the inter-temporal monetary-fiscal authority budget constraint.

Asset Management Company

The AMC buys loans from banks, receiving payment from firms (the gross interest rate times the repayment rate), and paying a price equal to the gross interest rate times the steady state repayment rate. This transaction is equivalent to AMCs subsidizing the return to lenders by increasing the fraction of delinquent loans to the steady state value. The net expenditure of the AMC is financed by the tax revenue raised from labor income

$$w_t n_t \tau_t = L_t((1-\bar{\delta}) - (1-\delta_t))(1+i_{L,t}). \tag{6}$$

Equation 6 sets the tax rate on labor income such that the AMC purchases loans from banks at a price that reflects the steady state rate of default, rather than the currently prevailing (market) rate. When the default rate incurred by borrowers is above (below) the steady state, the AMC is in deficit (surplus). We think of the loans as being purchased prior to the realization of the shock. In this sense our AMC is a permanent one, though we examine the implications following a negative shock in our impulse responses.

In practice, during economic downturns, AMCs often buy Non-Performing Loans (NPLs) at a price higher than the market value, thereby decreasing the banks' Loss Given Default (LGD). In our model, for simplicity, we assume that the AMC reduces the Probability of Default (PD) of the bank's assets, meaning the likelihood of assets turning into NPLs, instead of reducing the LGD. This represents a different conceptual approach to diminishing the banks' overall losses, but the economic effect is similar. The crucial aspect for assessing the health of a bank's balance sheet and its capacity to provide loans to the economy is its overall Expected Loss (EL), which is calculated as PD multiplied by LGD. Dávila and Walther (2020) show that large banks increase leverage in anticipation of bailouts, raising systemic risk; our AMCs mitigate this concern to an extent by acquiring delinquent loans at steady-state default rates without directly intervening in bank capitalization. Diamond and Rajan (2012) argue that crisis-driven interest rate interventions must balance liquidity and discipline, while Gertler et al. (2012) highlight the vulnerability of banks relying on short-term debt; our AMC model addresses both concerns by purchasing distressed assets to stabilize liquidity without the distortions of interest rate policy, thereby enhancing banks' resilience to short-term financial shocks. Unlike the liquidity provisioning policies in Del Negro et al. (2017), which primarily target the resaleability of private assets, AMCs resolve distressed asset markets by purchasing non-performing loans. This approach alleviates credit frictions through the bank lending and balance sheet channels, enabling a broader assessment of policy effectiveness in stabilizing financial systems.

We will consider two funding structures that allow us to focus on the role of the AMC affecting the default margin, rather than liquidity affecting the interest rate margin. The "Fiscal-Neutral" structure, presented above, does not affect the total quantity of money, and the expenditure of the AMC is funded entirely by income taxes from households in the same period. The second funding structure we call "Sterilized Liquidity Injections." Here, the AMC is funded by money issued by the monetary-fiscal authority, but which is then sterilized by adjusting the seigniorage transfer to households, and hence the demand for deposits. If the AMC funded by sterilized liquidity injections, Equations 5 and 6 become

$$P_t\Upsilon_t + P_t\Upsilon_{AMC,t} = \gamma\frac{M_{t+1}+M_{AMC,t+1}}{P_t} - \frac{M_t+M_{AMC,t}}{P_t} + \frac{1}{1+i_{B_t}}\gamma\frac{B_{t+1}}{P_t} - \frac{B_t}{P_t}.$$
$$P_t\Upsilon_{AMC,t} = \gamma\frac{M_{AMC,t+1}}{P_t} - \frac{M_{AMC,t}}{P_t} = L_t((1-\bar{\delta})-(1-\delta_t))(1+i_{L,t})$$

with $\tau = 0$, and where $M_{AMC,t+1}$ represents new money created by the monetary-fiscal authority to finance the AMC. As debt issued is held constant, the adjustment occurs through the lump-sum transfer to households, Υ_t.

Pandolfi (2022) shows that policy choices like bail-ins and bailouts impact banks' funding costs and incentives by altering expected crisis support. Bail-ins, which convert debt to equity, raise debt costs as creditors demand higher returns, potentially reducing banks' profitability and monitoring incentives, leading to riskier lending or constrained credit. In contrast, bailouts keep debt costs low due to implicit government backing but may encourage excessive risk-taking. Asset Management Companies (AMCs) improve bank profitability by enabling banks to offload distressed assets. In our setup, banks transfer these assets to the AMC at a price that determines their lending margin, including both the loan interest rate (based on actual default rates) and the default rate priced by the AMC. This setup incentivizes banks to expand lending aggressively, as they are guaranteed a positive return. Despite this high risk-taking, our results indicate welfare improvements, largely due to the absence of monitoring—banks do not anticipate the actual default rate, thus accepting lower-than-fair returns when real default rates fall below those priced by the AMC. In a model incorporating monitoring, such outcomes could ultimately encourage banks to improve monitoring practices over time.

The AMC presented in the model here is an abstraction, but nevertheless follows closely the economic logic that underpinned NAMA in Ireland. That agency was endowed with unfunded (unissued) Government bonds in a public-private partnership. This implied that NAMA remained off the state balance sheet from an accounting perspective, being only a contingent liability to the state in the case it could not repay those bonds. The bonds were used by NAMA to 'purchase' selected assets from participating banks. Those bonds were, in turn, used by the banks as collateral in central bank refinancing operations, thereby relieving those banks of their liquidity constraints (that stemmed in part from a scarcity of eligible collateral they could borrow against at the central bank). NAMA purchased assets from banks at so-called real economic value, on the basis that contemporaneous market conditions undervalued those assets, and that with appropriate management, the passage of time, and the avoidance of fire-sale conditions, higher asset values could be achieved in the future. This is a fundamental principle of asset management companies.

Aggregate Resource Constraint

Output is distributed between consumption, investment, and the cost of default

$$c_t + x_t + \frac{\Omega_t}{1+\xi}[\delta_t l_t (1 + i_{L,t})]^{1+\xi} = y_t. \tag{7}$$

In addition to Equation 7, market clearing requires that the supply of deposits by households equals the demand by banks. The supply of loans by banks equals the demand by firms. The supply of labor by households equals the demand by firms, and the supply of money and bonds by the monetary-fiscal authority equals the demand by households (and potentially the AMC). All agents and institutions are price takers and expectations are rational.

Equilibrium Analysis

Figure 1 shows the effect of the AMC in general equilibrium. The solid red line refers to the relationship between deposit rates, lending rates, and default rates in Equation 4. It plots the locus of points in the lending rate (x-axis) and default rate (y-axis) space, given a deposit rate. The solid blue line represents the locus of points of the choice by firms to default and the lending rate, given the quantity of debt outstanding and credit conditions (Equation 2). Absent an AMC, the two lines intersect at $E1$. If the AMC is present, it reduces the default rate faced by banks to $\bar{\delta}$, corresponding to the lending rate implied by $E2$. At this lending rate, firms will default at the point given by $E3$. The difference between the two would then be funded by the AMC. However, as banks and depositors are price takers, the higher recovery rate on loans provided for by the AMC increases the return to deposits and expands the supply of deposits, and the bank rate schedule shifts inwards (red dashed line) and the new point is at $E4$. At this point, firms choose to default at $E5$. Although the quantity of loans issued to firms has increased, the quantity of defaults subsidized by the AMC has decreased from $E3 - E2$ to $E5 - E4$. In equilibrium, as firms face lower borrowing costs, they increase production and their net worth increases, improving credit conditions, lowering default rates, and further shifting the dashed blue line downwards.

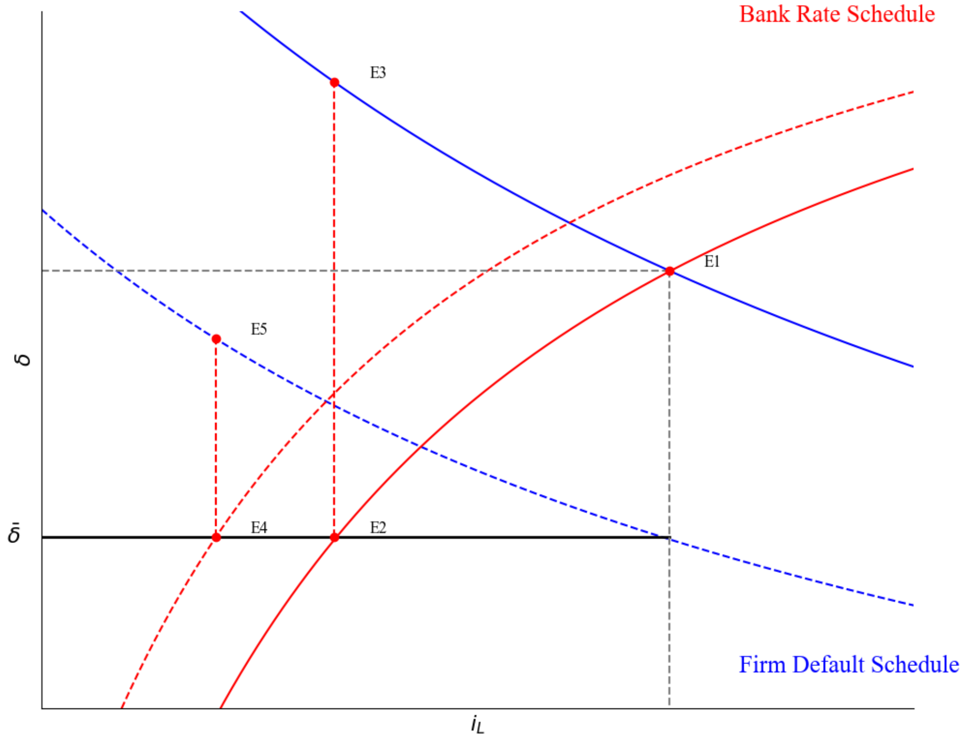

Figure 1: Firm Default and Bank Rate Schedules With and Without AMC.
Note: Vertical axis denotes default rate δ and the horizontal axis is the lending rate i_L given a deposit rate. The red line denotes the bank rate schedule described in Equation 4. The blue line denotes the firm default schedule described in Equation 2. $E1$ represents the intersection of the two lines pre-AMC. The AMC is introduced and banks face default rate $\bar{\delta}$: $E2$ represents the lending rate of banks for the corresponding default rate set by the AMC, $E3$ represents the default rate of firms for the corresponding bank lending rate at $E2$. AMC intervention compresses the default rate spread and shifts the supply of loanable funds causing the firm default schedule to shift outwards and the bank rate schedule to shift inwards (the dashed lines): $E4$ represents the new bank lending rate and $E5$ represents the new firm default rate for the corresponding bank default rate $\bar{\delta}$.

3.1 Quantitative Results

Calibration

We have adopted the calibration method of Jaccard (2024) for the Eurozone using data from the mid to late 1990s to 2018. Calibrated parameters are found in Table 1 while the moments that are matched are in Table 2. The deterministic growth rate of the economy is determined using annual data on population growth from 1960 onward. During the period from 1960 to 2018, the average annual population growth rate for the countries now in the Eurozone was 0.45%, leading to a quarterly growth rate (γ) of 1.00112. In the production function for the final output good, we set the capital share parameter (α) at one-third, implying a labor share of two-thirds. The curvature parameter (σ) is set at 1. The first labor supply parameter (ψ) is calibrated so that in a stable state, individuals allocate approximately 20% of their time to work-related activities, equating to a value of 0.2 for n. Finally, the curvature parameter (ν) is selected to reflect a Frisch elasticity of labor supply around 0.8. The steady state money supply $\bar{M}$ is set to 1 given the long-run neutrality of the level of money supply in the model. The default rate on loans each quarter is set to 4.39%.

Table 1: **Parameters Calibrated to Match Moments**

β	μ	η	ϵ	$\tilde{d}$	ϕ_π	ϕ_{i_B}	ϕ_y	σ_a	ρ_a	σ_{i_B}
0.992	0.97	0.62	0.1	.011	3	0.9	.03	0.006	0.979	0.013

Note: Parameters in this table are chosen to match the moments in the table below. β,μ,η,ϵ, and δ are the discount factor, credit constraint, intermediation efficiency, elasticity of the investment cost and depreciation rate respectively. ϕ_π, ϕ_{i_B}, and ϕ_y are the exponents of the inflation rate, interest rate smoothing, and output response in the Taylor rule. σ_a, ρ_a, and σ_{i_B} are the standard deviation and autoregressive coefficient of the TFP and standard deviation of the interest rate shock respectively. Although we have less parameters than Jaccard (2024), keep the values of the common parameters except for ϵ, the elasticity of investment which is significantly smaller.

Table 2: **Moments: Model vs Data**

	Data	Model
	Confidence Interval (95%)	Simulated Moments (2nd Order)
$std(g_y)$	[1.6, 2.1]	1.6
$std(g_c)$	[0.9, 1.2]	1.0
$std(g_x)$	[5.0, 6.6]	5.2
$std(g_D)$	[1.8, 2.4]	2.1
$std(g_P)$	[0.8, 1.1]	0.9
$std(i_D)$	[1.8, 2.4]	1.3
$E(i_D)$	[2.1, 2.6]	4.0
$E(i_L^* - i_D)$	[2.2, 2.4]	2.9
$E(l/y)$	[0.88, 0.95]	0.88
$E(x/y)$	[0.21, 0.22]	0.17

Note: The data are the targeted moments in Jaccard (2024). g_y, g_c, g_x, g_D, g_P are the growth rates of output, consumption, investment, deposits, and price levels between the current quarter and 4 quarters prior (year on year growth rates). i_D is the annualized quarterly deposit rate, while i_L^* is the annualized quarterly loan rate after default (i.e. the net of default loan rate). l/y is the ratio of real loans to output, and x/y is the ratio of investment to output.

Simulation and Results

We compare two alternative funding regimes for the AMC. In the first, the expenditure of the AMC is financed entirely through lump-sum fiscal transfers (immediately) and is so neutral on the fiscal balance. We call this the Fiscal-Neutral regime. The second regime is where the expenditure of the AMC is financed through borrowing from the central bank, but without expanding the total money supply. In this regime, which we call sterilized Liquidity Injections, the expenditure of the AMC crowds out the liquidity used for the deposit/loan market.

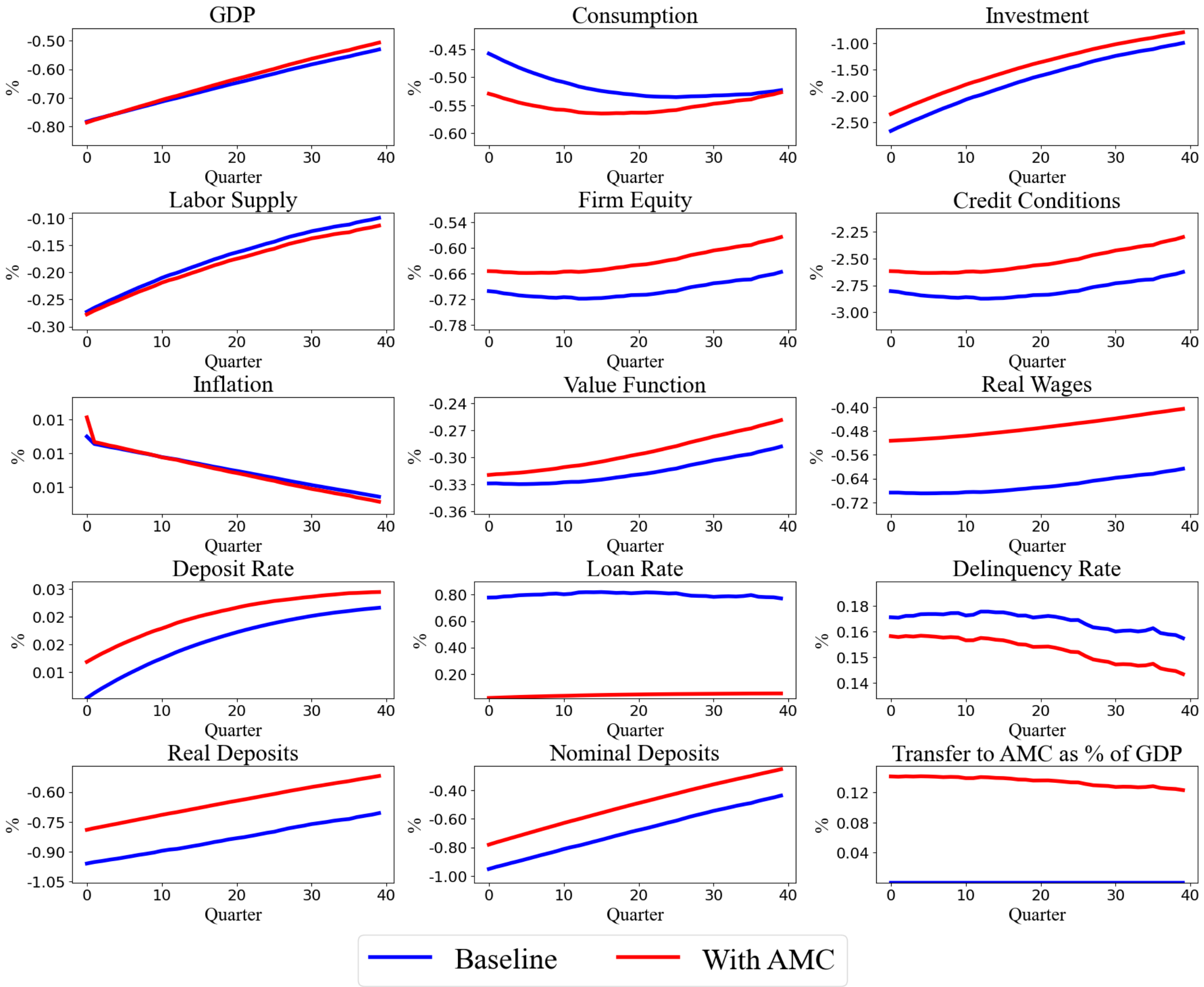

Figure 2: IRFs to a 1% negative TFP shock for the Fiscal-Neutral regime.
Note: GDP (y_t) denotes the deviation of the log level of output from the steady state post shock. Consumption (c_t), Investment (x_t), Labor Supply (n_t), Firm Equity (v_t), Credit Conditions (Ω_t), Value Function (V_t), Real Wages (w_t), Real Deposits (d_t), and Nominal Deposits (D_t) are similarly defined. Inflation (π_t) denotes the deviation of the inflation from the steady state post shock. The Deposit Rate ($i_{D,t}$), Loan Rate ($i_{L,t}$), Delinquency Rate (δ_t), and Transfer to AMC as % of GDP ($P_t\Upsilon_{AMC,t}$, zero absent the AMC) are similarly defined.

The two funding structures we analyzed result in similar economic outcomes, as shown in Figures 2 and 4 (in the Appendix). The Asset Management Company (AMC) enhances the returns of financial intermediaries after accounting for defaults. These intermediaries then offer higher interest rates to depositors, which increases deposit supply and eases credit constraints for businesses. This leads to more investment, higher output, and increased profits, which in turn boosts the value of company equity. Improved company equity value enhances credit conditions and increases repayment rates, further benefiting financial intermediaries. These intermediaries can then offer lower lending rates to firms and provide better returns to depositors. Kollmann et al. (2012) show that fiscal interventions targeting bank capital during crises can stabilize aggregate demand. Similarly, we find that AMCs enhance bank lending returns and strengthen corporate balance sheets, thereby supporting macroeconomic stability by reducing pecuniary externalities, though without increasing overall public debt. The increase in household savings, and ultimately higher real deposits, happens in our model through higher deposit rates that banks can offer because of their higher yielding loans with AMC intervention. This is in contrast to Cui and Sterk (2021) who show how quantitative easing improves liquidity for households, raising aggregate demand. This is a channel that our model also leverages by enhancing bank liquidity through non-performing loan (NPL) purchases, which in turn boosts lending and supports aggregate demand during downturns, though through investment rather than consumption.

In our model, the establishment of an AMC doesn't directly lower the rates of loan delinquency. Instead, it effectively reduces the default rates banks encounter by supporting them. In practice, this reduction in delinquency rates occurs when the AMC buys non-performing assets from banks, often paying more than the market value. This process lowers the banks' rates of delinquency, which maintains depositor confidence and increases actual deposits. With fewer non-performing loans, banks can offer higher rates on deposits to attract more savers. Also, with cleaner balance sheets, banks are more capable of extending new credit. Santos and Suarez (2019) argue for liquidity standards that extend the time for assessing banks' financial health before intervention; similarly, our AMC model lengthens the time banks can endure financial distress by removing troubled assets early, thus pre-emptively reducing the need for lender-of-last-resort measures. In contrast to TARP, where recipients increased their risk exposure while maintaining favorable regulatory capital ratios (Duchin and Sosyura, 2014), our AMCs set purchase prices based on steady-state conditions, preventing artificially inflated capital ratios and effectively mitigating risk.

Drucker and Puri (2009) show that loan sales, although restrictive due to covenants, are associated with increased credit availability, particularly for high-risk borrowers undertaking capital-intensive projects like acquisitions and leveraged buyouts. They find that sold loans are nearly twice the size of retained loans, largely due to nonbank institutions' involvement in the secondary loan market, which provides additional funding without originating loans. In our model, the impulse response functions reveal a similar role for Asset Management Companies (AMCs), which absorb distressed assets and increase banks' lending capacity. Balgova et al. (2017) support this by finding that AMCs, especially when combined with public recapitalization funds, effectively resolve non-performing loans (NPLs) and revive credit growth over time. Like loan sales, AMCs enhance credit availability by stabilizing banks' balance sheets, which our results show supports higher credit supply under structured conditions. Additionally, the higher supply of loan deposits with an AMC emphasizes the importance of stable funding sources during crises, as banks with more stable deposits continued lending (Cornett et al., 2011).

The balance sheet channel through which AMCs are effective is similar to the impacts of liquidity facilities quantified in Del Negro et al. (2017). However, the mechanisms differ significantly. The balance sheet channel in their paper operates by increasing the liquidity of private financial assets, enabling firms to use these assets more effectively as collateral. In contrast, the AMC-driven balance sheet channel directly removes non-performing loans from bank portfolios, reducing their exposure to credit risk and enabling them to extend new credit. This fundamental difference allows AMCs to specifically target distressed segments of the financial system, creating a virtuous cycle of enhanced bank stability, increased corporate creditworthiness, and improved macroeconomic outcomes. As such, AMCs complement liquidity facilities by addressing distinct financial market inefficiencies.

Welfare

We present conditional and unconditional welfare differences with the AMC under both regimes. The results are under both TFP and Monetary shocks using the parameterizations for the shocks described in Section 3.1. Unconditional welfare is the ergodic mean of the simulation under the second-order Taylor series approximation of the economy. Conditional welfare is the welfare of the economy at the deterministic steady state (Schmitt-Grohe and Uribe, 2004; Born and Pfeifer, 2020). This welfare measure considers the economy's position at a given starting point and assesses it using a second-order Taylor approximation around the deterministic steady state. Our primary welfare metric evaluates households' welfare when they anticipate future shocks from this steady state. This assessment requires estimates of policy functions and shock parameters.

Table 3: **Consumption Equivalent Welfare Difference**

	Unconditional	Conditional
Fiscal Neutral	0.63%	0.16%
Sterilized Liquidity	0.60%	0.24%

Note: Unconditional welfare is calculated by as the ergodic mean of the economy while conditional welfare conditions on the deterministic steady state. The economy is subject to both shocks that are parameterized according to the calibrated values. Consumption Equivalent differences are calculated numerically by simulation.

Table 3 shows that AMCs consistently yield welfare gains under both Fiscal Neutral and Sterilized Liquidity funding regimes, with quarterly consumption equivalent increases of 0.63% and 0.6% for unconditional welfare, and 0.16% and 0.24% for conditional welfare, respectively. These improvements occur in regular market conditions rather than during crisis events, underscoring the AMC's stabilizing effect on lending across business cycles. By offering lower prices for loans (higher default rates) in booms and higher prices (lower default rates) in downturns, AMCs balance risk and credit supply, a dynamic that resembles the credit-stabilizing role of structured loan sales in the secondary market (Drucker and Puri, 2009).

In our setup, banks transfer distressed assets to the AMC at a price that shapes their lending margin, incorporating both the loan interest rate and the default rate priced by the AMC. This arrangement incentivizes banks to expand lending aggressively, knowing they are guaranteed a positive return. Even with heightened risk-taking, our results show welfare improvements, largely due to the absence of monitoring—banks do not anticipate the actual default rate and thus accept lower-than-fair returns when real default rates fall short of those priced by the AMC. This dynamic aligns with Kasinger et al. (2021), who argue that AMCs can, over time, encourage banks to adopt better monitoring practices by providing feedback on loan performance through pricing mechanisms. This gradual shift toward enhanced monitoring could ultimately lead to more prudent lending practices, fostering both stability and welfare gains in the long term.

Balgova et al. (2017) argues that AMCs, especially when paired with public recapitalization funds, are effective in reducing non-performing loans (NPLs) and revitalizing credit growth, thus enhancing financial stability. Our results mirror this stabilizing effect, as the AMC's role in absorbing distressed assets allows banks to maintain lending capacity even under fluctuating default rates. Cornett et al. (2011) highlight that banks with stable funding sources are better able to sustain lending during crises, emphasizing the importance of policies that support credit availability even in high-risk periods.

4 Conclusion

This paper investigates whether an Asset Management Company can effectively manage non-performing loans without depending on expansionary fiscal or monetary policy. We show that an AMC can boost welfare by increasing loanable funds, strengthening firm balance sheets, and encouraging capital investment. This research fulfills the need for quantitative analysis of AMCs' capacity to offset the economic effects of downturns characterized by high NPL levels, which can restrict bank lending and dampen investment. Furthermore, the positive impacts of an AMC do not require prolonged government debt or liquidity expansions, suggesting that AMCs offer a viable alternative or complementary tool for macro-financial stability.

In the context of a financial crisis, fiscal measures are often constrained. When such measures are accessible, crisis resolution can proceed more quickly and efficiently, potentially making an Asset Management Company unnecessary. However, recent European sovereign crises have repeatedly shown the scarcity of fiscal space for tackling large banking sector problems. Additionally, when fiscal intervention is used to support banks, these institutions may be recapitalized but still retain non-performing assets on their balance sheets. This retention, despite new capital, can lead banks to hold unrealistic expectations about asset recovery, resulting in resource misallocation and value erosion of distressed borrowers' collateral. In contrast, an AMC offers a unique advantage by shifting incentives without immediate fiscal spending; instead, the state assumes a contingent liability with a preference for maintaining its contingency. AMCs can create a 'bridge to the future' by transferring NPLs from the originating banks to the AMC, which subsequently works them out once markets, e.g., for real estate, have recovered from their trough. While this intertemporal channel is important for an AMC, we have shown that an AMC can be beneficial even in the short-medium term because it can dampen the amplification effects of default through the banking system.

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5 Appendix

NPL Resolution Mechanisms

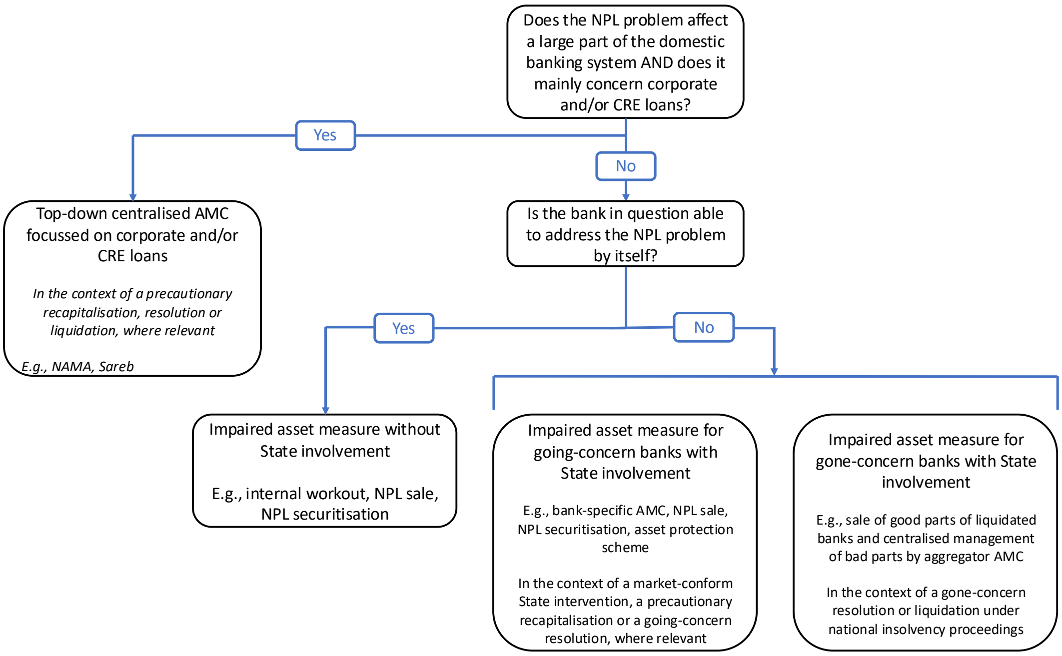

Figure 3: Source: Grasmann et al. (2019). Note: CRE refers to commercial real estate; MPS to Monte dei Paschi di Siena; and GACS to Italy's Fondo di Garanzia sulla Cartolarizzazione delle Sofferenze.

Dynamic Equations

The following is under the fiscal-neutral AMC regime. If the AMC is not operational, $\bar{\delta} = \delta_t$.

$$\begin{aligned} c_t + x_t + \gamma \frac{M_{t+1}}{P_t} + \frac{1}{1+i_{B_t}} \gamma \frac{B_{t+1}}{P_t} \\ = \Pi_{T_t} + P\Upsilon_t + r_{K_t} k_t + w_t n_t (1-\tau) + i_{D_t} \frac{D_t}{P_t} + \frac{M_t}{P_t} + \frac{B_t}{P_t} \end{aligned} \tag{8}$$

$$\gamma M_{t+1} = D_t \tag{9}$$

$$\gamma k_{t+1} = (1-\tau) k_t + \left(\frac{\theta_1}{1-\epsilon} \left(\frac{x_t}{k_t} \right)^{1-\epsilon} + \theta_2 \right) k_t \tag{10}$$

$$y_t = a_t k_t^{\alpha} n_t^{1-\alpha} \tag{11}$$

$$\Pi_{F,t} = y_t - (1 - \mu (1 - (1-\delta_t)(1+i_{L,t}))) (r_{K_t} k_t + w_t n_t) - \frac{\Omega_t}{1+\xi} [\delta_t l_t (1+i_{L,t})]^{1+\xi} \tag{12}$$

$$l_t = \mu (r_{K_t} k_t + w_t n_t) \tag{13}$$

$$l_t = \eta d_t \tag{14}$$

$$\Pi_{b,t} = \eta d_t \left((1-\bar{\delta})(1+i_{L,t}) - 1\right) - d_t i_{D_t} \tag{15}$$

$$P_t \Upsilon_t = \gamma \frac{M_{t+1}}{P_t} - \frac{M_t}{P_t} + \frac{1}{1+i_{B_t}} \gamma \frac{B_{t+1}}{P_t} - \frac{B_t}{P_t}. \tag{16}$$

$$c_t + x_t + \frac{\Omega}{1+\xi} \left[\delta_t l_t (1+i_{L,t})\right]^{1+\xi} = y_t \tag{17}$$

$$w_t n_t \tau = L_t \left((1-\bar{\delta}) - (1-\delta_t)\right)(1+i_{L,t}) \tag{18}$$

$$\kappa c_t^{\kappa-1}(\psi + z_t^{\nu})\left(c_t^{\kappa}(\psi + z^{\nu})\right)^{-\sigma} = \lambda_t \tag{19}$$

$$c_t \frac{\nu z_t^{\nu-1}}{\kappa(\psi + z_t^{\nu})} = w_t \tag{20}$$

$$1 = q_t \theta_1 \left(\frac{x_t}{k_t}\right)^{-\epsilon} \tag{21}$$

$$\lambda_t q_t = \mathbb{E}_t \beta \lambda_{t+1} r_{K_{t+1}} + \mathbb{E}_t \beta \lambda_{t+1} q_{t+1} \left[(1-\tilde{d}) + \frac{\theta_1}{1-\epsilon}\left(\frac{x_t}{k_t}\right)^{1-\epsilon} + \theta_2 - \theta_1 \left(\frac{x_t}{k_t}\right)^{1-\epsilon}\right] \tag{22}$$

$$\lambda_t \frac{1}{P_t} \frac{1}{1+i_{B_t}} = \mathbb{E}_t \beta \lambda_{t+1} \frac{1}{P_{t+1}} \tag{23}$$

$$\lambda_t \frac{1-i_{D_t}}{P_t} = \mathbb{E}_t \beta \lambda_{t+1} \frac{1}{P_{t+1}} \tag{24}$$

$$\Omega_t = \bar{\Omega} \left(\frac{N_t}{\bar{N}}\right)^{\phi} \tag{25}$$

$$\frac{\Omega}{\delta_t} \left[\delta_t l_t (1+i_{L,t})\right]^{1+\xi} = l_t (1+i_{L,t}) \tag{26}$$

$$\log a_t = \rho_a \log a_{t-1} + \epsilon_a \tag{27}$$

Under a regime of an AMC funded by sterilized monetary transfers, Equations 16 and 29 become

$$P_t \Upsilon_t + P_t \Upsilon_{AMC,t} = \gamma \frac{M_{t+1} + M_{AMC,t+1}}{P_t} - \frac{M_t + M_{AMC,t}}{P_t} + \frac{1}{1+i_{B_t}} \gamma \frac{B_{t+1}}{P_t} - \frac{B_t}{P_t}. \tag{28}$$

$$P_t \Upsilon_{AMC,t} = \gamma \frac{M_{AMC,t+1}}{P_t} - \frac{M_{AMC,t}}{P_t} = L_t \left((1-\bar{\delta}) - (1-\delta_t)\right)(1+i_{L,t}) \tag{29}$$

with $\tau = 0$.

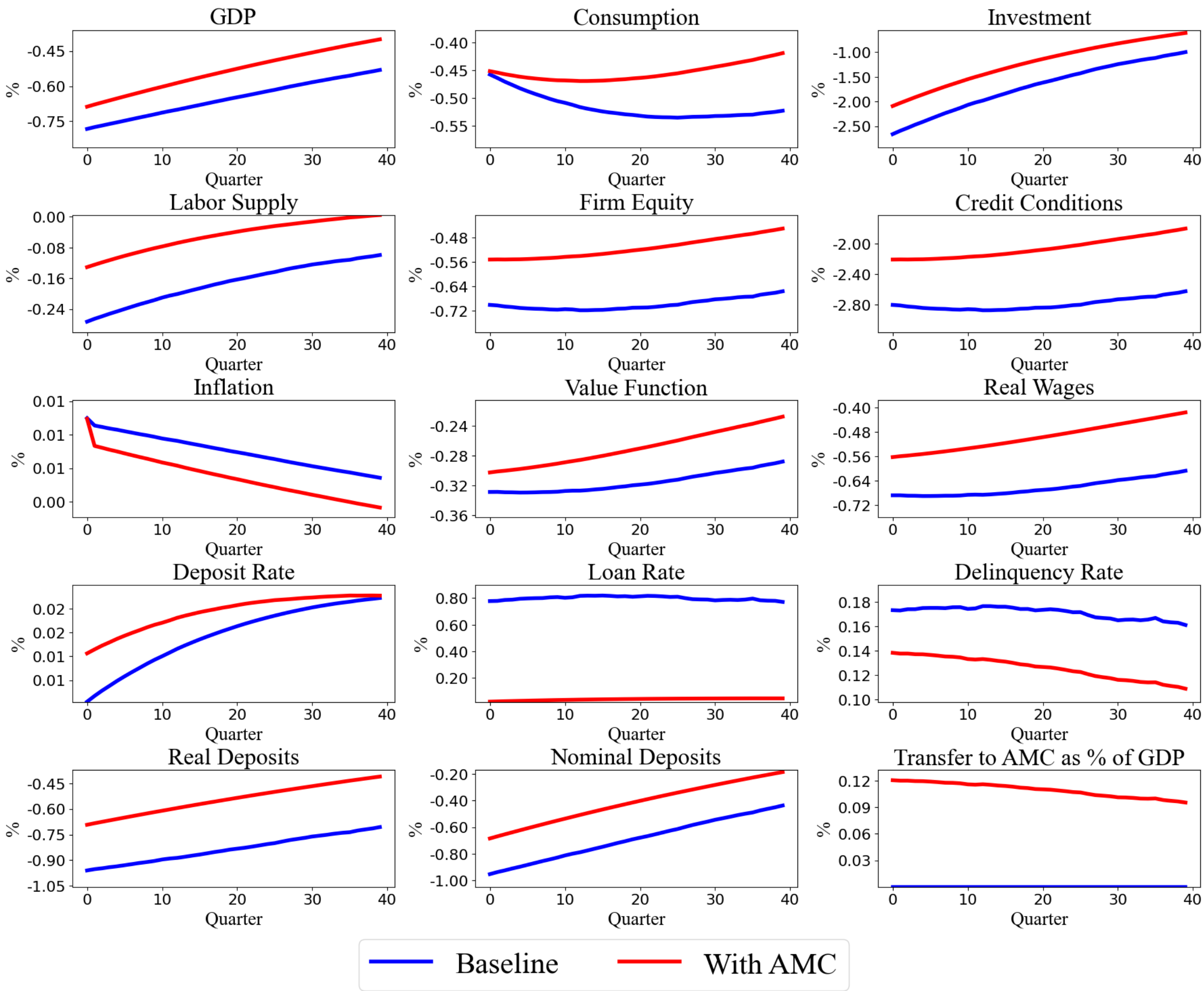

Figure 4: IRFs to a 1% negative TFP shock for the sterilized Liquidity Injections regime. *Note:* GDP (y_t) denotes the deviation of the log level of output from the steady state post shock. Consumption (c_t), Investment (x_t), Labor Supply (n_t), Firm Equity (v_t), Credit Conditions (Ω_t), Value Function (V_t), Real Wages (w_t), Real Deposits (d_t), and Nominal Deposits (D_t) are similarly defined. Inflation (π_t) denotes the deviation of the inflation from the steady state post shock, The Deposit Rate ($i_{D,t}$), Loan Rate ($i_{L,t}$), Delinquency Rate (δ_t), and Transfer to AMC as % of GDP ($P_t \Upsilon_{AMC,t}$, zero absent the AMC) are similarly defined.

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Reiner Martin
National Bank of Slovakia, Bratislava, Slovakia; email: reiner.martin@nbs.sk

Edward O'Brien
European Central Bank, Frankfurt am Main, Germany; email: edward.obrien@ecb.europa.eu

M. Udara Peiris
Oberlin College, Ohio, United States; email: upeiris@oberlin.edu

Dimitrios P. Tsomocos
Saïd Business School and St Edmund Hall, University of Oxford, Oxford, United Kingdom; email: dimitrios.tsomocos@sbs.ox.ac.uk

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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